SESSION 10

RSA Advances and International Outlook

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WHERE DOES RSA/R GO IN THE FUTURE?

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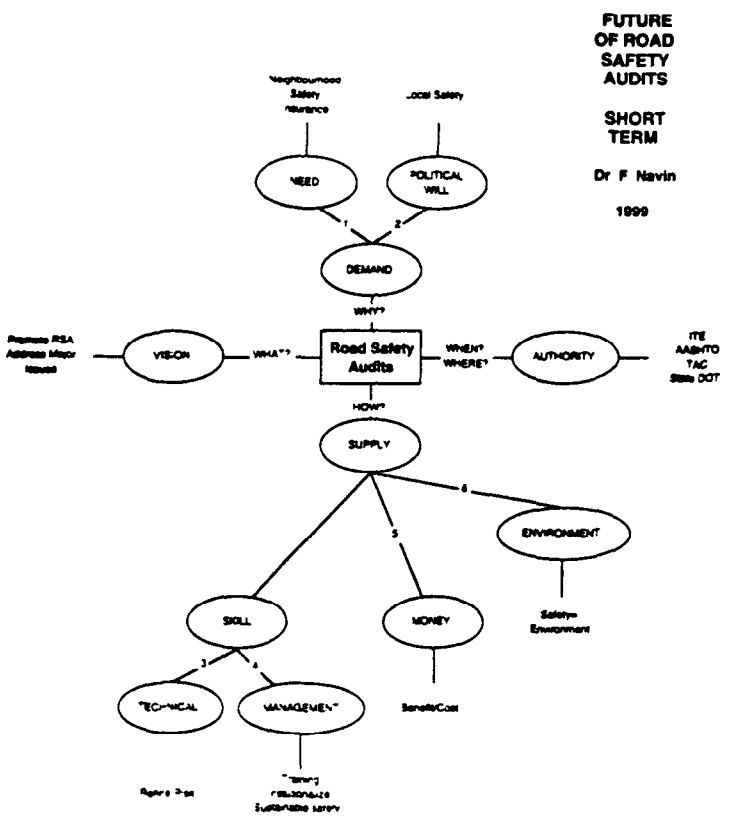
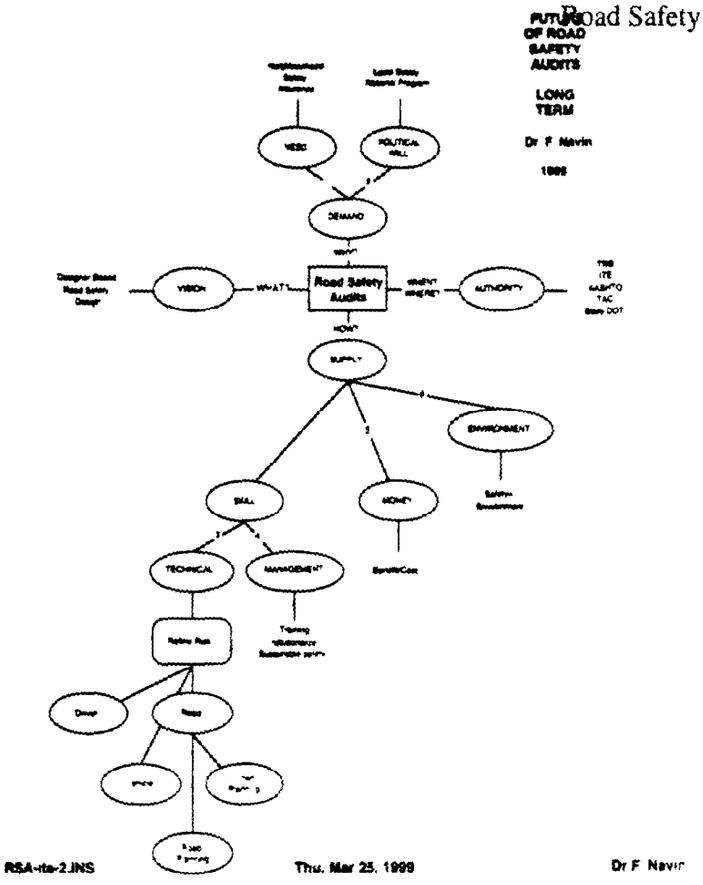
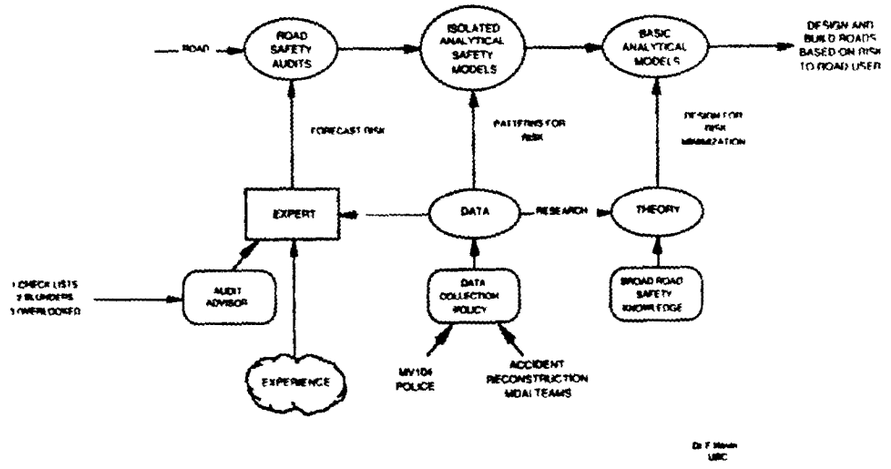
- **RSA/R must be an integral part of the highway design process.**
- **RSA/R lessons learned must be passed on to designers.**
- **The theory of road safety must be developed to include RSA/R at the design stage with forecasting equations.**
- **RSA/R must have a better economic foundation so that changes may be economically driven.**

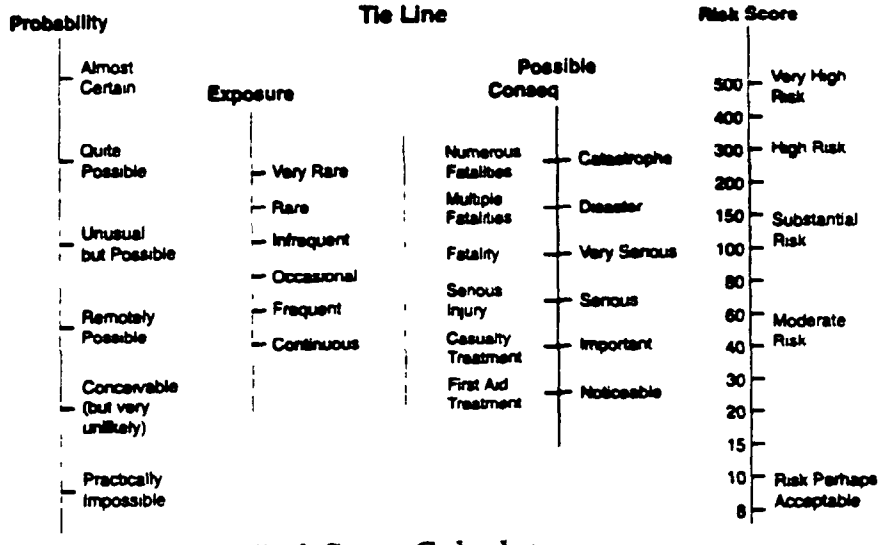




The Future of
Road Safety Audits

GETTING BEYOND
THE RSA EXPERT





Risk Score Calculator

Source National Safety Council of Australia Ltd

Road Safety Audit - Current Status and Issues Internationally

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INTRODUCTION

Road safety audit is the examination of a road/traffic project by an independent, qualified examiner to ensure that the project achieves the greatest safety possible It is a straightforward process, and in simple terms allows good sound road safety engineering input into agreed stages of a road project where previously that may not have been the case

The adoption of road safety audit has become an international issue in the recent years, with countries such as Canada, the United States, South Africa, Malaysia, and Thailand joining the three leading nations - Great Britain, Australia and New Zealand in the adoption of this road safety process

In May 1998 the First International Road Safety Audit Forum was convened by AUSTROADS and held in Melbourne, Australia Almost 200 delegates from 14 countries attended the 2 day Forum and most stayed on for a further three days of technical tours and a training workshop This paper presents some of the outcomes of the Forum - the international issues which were raised as well as the 10 point communique from the Forum which is intended to assist jurisdictions as they prepare to embark on the implementation of road safety audit

THE AUSTROADS ROAD SAFETY AUDIT PROCESS

AUSTROADS defines road safety audit as "a formal examination of an existing or future road or traffic project, or any project which interacts with road users, in which an independent, qualified examiner reports on the project's accident potential and safety performance " The earlier in the design process that a road safety audit takes place the more likely it is to be able to effectively influence safety in that scheme The AUSTROADS project recognised this and developed a five stage audit process with emphasis on early intervention

Feasibility Stage

By providing a specific safety input at the feasibility stage of a scheme, road safety audit can influence fundamental issues such as route choice, standards, impact on and continuity with the existing adjacent network, and intersection or interchange provision A site inspection is necessary, even for this early stage of audit, to gain a full appreciation of any potential safety problems which could arise if the scheme proceeds to completion

Draft Design Stage

This audit occurs on completion of the preliminary road design Typical considerations will include horizontal and vertical alignments, and intersection layouts Subsequent significant changes in road alignment become much harder to achieve after this stage as land acquisition and other associated legal matters become finalised A site inspection, daytime and nighttime, is important to give the audit team the true picture of the environment in which the project is to take place

Detailed Design Stage

This audit occurs on completion of the detailed road design but before the preparation of contract documents Typical considerations include geometric layout, linemarkings, signals, lighting, signing, intersection details, clearances to roadside objects (crash barriers/frangibility,) and provision for vulnerable road users Attention to detail at this design stage can do much to reduce the costs and disturbances associated with last minute changes which may otherwise be brought about with a Stage 4 (pre-opening) audit It is cheaper and easier to change some marks on a drawing than to re-build/rectify a hazardous treatment

Pre-Opening Stage

This audit involves a detailed inspection of a new scheme prior to its opening The new road is driven, ridden and walked (when appropriate) by the audit team to ensure that the safety needs of *all* road users are provided for A night time inspection is particularly important to check signing, delineation and other darkness-related issues

The Audit of Existing Roads

This audit aims to ensure that the safety features of a road are compatible with the functional classification of the road, and to identify any feature which may develop over time into a safety concern

The AUSTROADS process stresses independent, qualified auditors, submitting written audit reports through a formal management arrangement The process in turn requires a written response from the project manager to the recommendations of the audit report

CURRENT STATUS AND ISSUES IN ROAD SAFETY AUDIT - INTERNATIONALLY

Great Britain audit is required for all works on motorways and trunk roads, and is commonly practiced Some concerns from local government that the adoption of audit is still not as widespread as necessary

Australia no regulatory requirement to audit, but audit is common for major projects and is increasingly becoming adopted by local government Training workshops are a feature of advancement of the process throughout Australia

New Zealand similar to Australia, with audit being established for major projects since the early-mid 1990's, and with local government being encouraged to take a more active role

Malaysia	a set of national guidelines were released in 1998 and have set the scene for national adoption of the audit process
South Africa	a series of introductory training workshops has been held, and a draft set of national guidelines ahs been prepared by CSIR
Canada	the Highway 407 audit provided a landmark introduction to this process in Canada The use of audits is continuing to grow in several Provinces, with Hamilton Associates taking a lead role in the promotion of the process throughout the west
United States	some pilot audits, some training workshops and adoption of selected stages of audit by several states has taken place ITE has two committees looking at ways to advance the adoption of road safety audit in the US and globally
Singapore	the Land Transport Authority is developing guidelines for the use of road safety audit in Singapore A major introductory workshop was held in March 1999

SOME INTERNATIONAL ISSUES

- **There is a need for a nationally accepted system of accreditation for road safety auditors.**

The present system by which a client selects a road safety auditor is prone to two main problems Firstly, the client may not be able to find a complete listing of all potential auditors This will restrict their access to the widest range of auditors from which to choose Secondly, when selecting an auditor, how can the client be sure that the auditor is "qualified" and is the best one for the task? The answer to these concerns is a nationally accepted accreditation system for auditors which can be readily accessed by clients The Adelaide Road Safety Audit Summit lead to the formulation of the following model for accreditation

A	Five years (minimum) relevant experience in road design, traffic engineering, road safety engineering or other closely related road safety discipline
B	Successful completion of a road safety audit training course, approved and recognised by a State Road Authority
C	Participation in at least five road safety audits under the guidance /leadership of a Senior Auditor, of which at least three must be design stage audits, and another must be a Stage 4 or 5 audit
D	Certify maintenance of knowledge and experience by participating in at least one audit per annum

To be listed as a Road Safety Auditor, a person will be required to satisfy points A and B above To be listed as a Senior Road Safety Auditor, a person will be required to satisfy points A, B, and C above Both levels of auditor will be required to satisfy point D in order to remain on the list of accredited auditors

- **The trend to accepting the lowest quote without assessing skills/expertise of the auditor.**

This has been in part due to the absence of a system of auditor accreditation for clients to call upon Australian experience with audit costs is indicating that a design stage audit of a large scheme may cost some $2,500 per stage, and a small scheme may cost up to $1,000 per stage Many consultants are keen to establish themselves as experienced auditors in what is seen as a growth area, and at present a wide variety of tender prices are often received in response to an advertisement for an audit The "market place" is establishing the "going rate" for audits, but there is a very real concern that the continued lack of any form of accreditation for auditors is allowing underpriced and under skilled people into a field where skill and judgement is paramount

- **The trend towards one man audit "teams".**

This is a disappointing trend, and was condemned in the Adelaide Summit which strongly supported the use of teams of two or three auditors with differing experiences Those at the Summit who had participated in audit teams praised the value which was added to an audit through the inputs of additional experienced road safety professionals - Police, road safety officers, design engineers, construction engineers etc etc

- **How good is road safety audit as a road safety engineering tool?**

There is no evaluation yet available which can support the instinctive feel that road safety audit is a very highly cost-effective process We may believe that road safety audit is an excellent process, worth its weight in gold, but how do we convince the people with the money to put funds into it and/or to fund improvments to safety problems identified by it? Accident investigation (blackspot) programs have been shown to produce BCR's of some 400% but the effectiveness of road safety audit remains unevaluated A road safety audit evaluation project is needed so that the road safety audit process may finally be able to bid for public funds and be competitive with other road bids AUSTROADS has commissioned a project to examine this

- **Commitment to road safety audit in local government.**

The rate of adoption of road safety audit, especially within local government, is much slower than desirable This has led to speculation about the level of commitment to this task by senior management of these organisations in Australia Some municipal highway authorities have road safety audit policies in place, others are working towards them, but the widespread adoption of the safety audit process is slower than many would like This may be a reflection of the economic situation, or it might be a reflection of the need for auditors to market the benefits of their process more effectively

While large projects are tending to be audited, generally at each stage, other small projects - such as traffic management improvements - are tending to be left unaudited This adds to the concerns about commitment, especially by local government which is responsible for fewer of the large projects and more of the small ones Will the road safety audit process eventually have to be legislated for, or be made an essential element for the receipt of government funding, before it becomes an integral part of the road design process for all projects?

- **A majority of audits carried out to date have been audits of existing roads.**

The VicRoads study revealed 58 3% of all audits were Stage 5 audits This is understandable as road authorities have tried to "catch-up" with the existing network by auditing main roads and highways as a matter of priority As well, the Stage 5 audit is perceived to be the "easiest" stage of audit, the one stage which can be undertaken by existing staff who can use the experience to prepare for later design stage audits Unfortunately, this focus on Stage 5 audits has lead to a mistaken view of audits amongst some professionals that road safety audits and accident remedial work are identical (ie they confuse the use of reported accident histories etc) It has also left a legacy of numerous Stage 5 audit reports recommending safety improvements (sometimes costed at millions of dollars) which cannot be treated because of funding constraints This in turn has lead to a loss of confidence in the road safety audit process - at all stages - why do an audit if you can't fund the improvements???

- **How can expenditure on a road safety audit report recommendation be justified, when there are insufficient funds for improvements to proven blackspots?**

It is very difficult to fund road safety audit recommendations - especially those of Stage 5 audits which require expenditure at locations with no reported accidents - when an authority has insufficient funds to treat all of its blackspots Funding of design stage audit recommendations is generally a lesser concern as often the change can be made to a drawing before anything is built Wise managers will recognise that funding road safety audit of the design stages is good insurance, and can save money from being wasted later But, as pointed out earlier, how can money be justified for a site with no recorded accidents (even though it may be recorded in an audit report as having a safety problem) when there are plenty of accident blackspots waiting to be treated

- **Some see road safety audit as a compliance check to ensure that standards are met.**

It is much more than that! A road safety audit should never be seen solely as a check to ensure that all current standards are satisfied To explain this further, consider an example of a Stage 3 audit of a rural re-alignment - it should ensure, amongst other things, that minimum horizontal and vertical alignments are achieved It should also seriously question whether those standards are adequate for the project, and whether or not they need to be raised (for instance, is the area prone to fog?) But most importantly, the auditor must put him/herself in the shoes of the road user and ask the important question "What will the road user make of this design?"

Lets imagine this sample section of rural road is straight, following a line of power poles for two kilometres before curving to the left The line of power poles keeps straight, following the alignment of the "old road" What would any motorist, under any weather condition, under any light condition and under any physical condition (maybe the influence of alcohol) make of the visual message given by the power lines? From a distance, does the road go straight on, or does it curve? The road safety audit would bring this concern to the attention of the project manager, although there is no such thing as a standard for the "visual influence of poles next to roads" The audit report may recommend additional delineation (above and beyond the minimum specified in a standard) at the end of the straight to override the visual deceit created by the line of poles Clearly, a road safety audit is more than compliance with standards

- **Training in the audit process is vital if safety audit is to retain credibility as a powerful road safety process.**

At the moment such training lacks co-ordination nationally and is in need of firm direction at the national level Training should have a national or regional focus concluded that there are three groups in need of specific road safety audit training

- those who need awareness of the process (typically road safety professionals and senior managers)
- those who are to do the audits, and
- those who are to use and respond to the audit outcomes (typically project managers)

The Summit concluded that the minimum requirements of an approved road safety audit course would resent sessions on

- what road safety audit is and why it is needed,
- how road safety audit is applied,
- how road safety audit is managed,
- how to present an audit report, and how to respond to an audit report
- at least one "real-life" case study, preferably a Stage 1-3 audit

The Adelaide Summit also supported the proposal for a nationally accepted and accredited training course on road safety engineering which would include the two subjects - accident blackspot investigation, and road safety audit AUSTROADS is in the process of developing such a course which, in time, could bring Australia closer to our colleagues in Asia and the Pacific where governments are beginning to recognise their need for road safety engineering skills

AUSTROADS INTERNATIONAL ROAD SAFETY AUDIT FORUM

In May 1998, the ITE was a proud major sponsor of the AUSTROADS International Road Safety Audit Forum, held at the Hilton-on-the-Park, Melbourne Through its marketing of this major event, and with strong support from the local District 8 Committee, the ITE contributed greatly to the outstanding success of the Forum 189 delegates from 14 countries attended the two day Forum Most stayed on for a day of technical tours to major sites in Melbourne which have been road safety audited, and for the 2 day AUSTROADS/Local Government Professionals training workshop on road safety audit principals and practices With 107 delegates from 14 countries, that workshop is believed to hold the "record" for the largest road safety audit workshop yet held!

The Forum passed recommendations to assist with the continued development and promotion of road safety audit on a national and international basis The Institute of Transportation Engineers has a major role to play in this task, not just in North America where interest is high, but in other parts of the world where increasing rates of motorisation coupled with massive new infrastructure works means that the time is right for the introduction of a comprehensive road safety audit program

The 10 point communiqué

A central feature of the Forum was the drafting of a communiqué based on the discussion which emerged from the presentations and from detailed feedback from the workshop sessions The communiqué is intended for the information of road safety audit practitioners worldwide The final panel session of the forum provided an opportunity for delegates to discuss the draft communiqué together with the feedback from the workshop sessions Delegates were encouraged to offer written amendments or comments on the original draft communiqué AUSTROADS has sanctioned the communiqué as a useful tool to aid the promotion of the road safety audit process internationally

REDUCING ROAD TRAUMA	Engineers managing the road network must ensure that accidents and casualties are contained as the network develops Proven techniques and standards are therefore applied to guide road design and traffic management Road safety auditing is a powerful technique used in this approach
SPECIALIST SAFETY CHECKS	Road safety audit is a process for examining any road or traffic project using an independent, qualified and experienced team which produces a formal report on the safety problems Road safety audit involves a specialist review of relevant designs or existing roads against safety principles It is more than a compliance check against standards, it focuses on the needs of all road users
PREVENTION IS BETTER THAN CURE	Road safety audit is a preventive measure which saves casualties and reduces economic loss by reducing the incidence and consequences of traffic accidents It seeks to maximise safety in design, and avoid creating potential hazards
A VITAL DESIGN TOOL	Road safety audit is a vital tool in road safety engineering It is a proactive approach that needs to be part of the design process from start to finish, the earlier the better It is complementary to other reactive initiatives such as accident investigation and blackspot review program
BENEFITS ARE SUBSTANTIAL	Road safety audit is a low cost and effective tool which brings savings in project costs, and reductions in accidents and casualties It leads to an improved safety awareness in design and construction, and ultimately in improved design standards and management practices, ensuring a higher level of safety in the road environment

COMMITMENT BREEDS SUCCESS	The success of road safety audit depends on a strong commitment to the process from leaders and decision-makers in road authorities It must be part of corporate policy, integrated within quality management systems and include set procedures for dealing with audit findings and recommendations
TRAINING AND EXPERIENCE ARE ESSENTIAL	Road safety engineering specialists must be trained in the road safety audit process, and a register of qualified auditors established Qualifications must include relevant technical expertise, training, experience, and currency in road safety audit practice
SPREADING THE WORD	The value of road safety auditing must be actively promoted throughout the road design, traffic management and road safety disciplines, to encourage its adoption by national and local road authorities worldwide Common guidelines on road safety engineering principles and safety audit will assist in implementing the process
IMPROVEMENTS ARE NEEDED	Road safety audit continues to evolve Monitoring and evaluation of the process and its findings must continue so that road safety engineering practice can be further improved Research into the processes, methods and effectiveness of road safety audits must be encouraged and supported
LEARNING FROM EACH OTHER	Road safety audit can help to reduce the increasing road toll in developing countries An international network of road safety engineering practitioners will help to disseminate information on the safety audit process and findings, and to promote the value of this in road safety management

The Forum endorsed the position expressed in the above statements, as the basis for promoting and advancing road safety audit worldwide as an essential element in road safety management

CONCLUSION

Road safety audit will not necessarily make every new design totally "safe" but it will raise safety high on the decision making agenda and it will cause deliberate decisions to be made on the basis of carefully considered safety advice Road safety audit is changing the way that engineers are designing their new roads

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